

IN THE CLAIMS

1. (Previously Presented) A replica router comprising:

at least one communications interface;  
a processor coupled to the at least one communications interface; and  
a memory coupled to the processor;  
wherein the processor is configured to:  
receive a network request for access from a client computer;  
calculate a performance metric value for each of at least two server replicas, the value specifying an estimated communication performance between the client computer and a server replica based upon the client computer's location in a network; and  
direct the client computer to at least one server replica that is estimated to provide good performance based upon the client computer's location in the network based on the performance metric values of the server replicas as calculated by the replica router.

2. (Previously Presented) The replica router of claim 1 wherein the processor is further configured to:

receive advertisements from the server replica, the advertisements containing information from which the replica router calculates the performance metric value; and  
maintain a database of the server replica advertisements.

3. (Previously Presented) The replica router of claim 2 wherein the processor is further configured to:

match the replica advertisements to their actual source IP address where each of the replica advertisements contain the actual source IP address of the server replica;  
and  
determine whether any of the server replicas are located behind firewalls.

4. (Previously Presented) The replica router of claim 1 wherein the processor is further configured to:

receive a description of a client computer's network environment; and  
calculate the performance metric value for a server replica based upon the description of the client computer's network environment.

5. (Previously Presented) The replica router of claim 1 wherein the processor is further configured to calculate the performance metric value of a server replica based upon the performance metric value of at least one network router located in a path from the client computer to the replica router.

6. (Canceled)

7. (Previously Presented) The replica router of claim 1 wherein the processor is further configured to direct the client computer to a server replica that is estimated to provide good performance based upon the client computer's location in the network by directing the client computer to a replica router lower in a replica router hierarchy.

8. (Previously Presented) The replica router of claim 7 wherein the processor is further configured to cause a replica router advertisement to be sent to a replica router higher in the replica router hierarchy, the replica router advertisement containing information from which the replica router higher in the hierarchy calculates the performance metric value, the replica router higher in the hierarchy being programmed to store the replica router advertisement in the database of advertisements.

9. (Previously Presented) The replica router of claim 8 wherein the replica router higher in the hierarchy is programmed to match the replica router advertisement to its actual source IP address to determine whether the replica router that caused the replica router advertisement to be sent is located behind a firewall.

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10. (Previously Presented) For a replication router, a method of replica routing in a communications network comprising the steps of:

- receiving a network request from a client computer;
- calculating a performance metric value for each of at least two server replicas, the value specifying an estimated communication performance between the client computer and the server replica based upon the client computer's location in a network;
- directing the client computer to at least one server replica that is estimated to provide good performance based upon the client computer's location in the network based on the performance metric values of the server replicas as calculated by the replica router.

11. (Previously Presented) The method of claim 10 further comprising the steps of:

- receiving advertisements from the server replicas, the advertisements containing information from which the replica router calculates the performance metric values; and
- maintaining a database of the server replica advertisements.

12. (Previously Presented) The method of claim 11 further comprising the steps of:

- matching the replica advertisements to their actual source IP address where each of the replica advertisements contain the actual source IP address of the server replica; and
- determining whether any of the server replicas are located behind firewalls.

13. (Previously Presented) The method of claim 10 further comprising the steps of:

- receive a description of a client computer's network environment; and
- calculating the performance metric value for a server replica based upon the description of the client computer's network environment.

14. (Previously Presented) The method of claim 10 further comprising the step of calculating the performance metric value of a server replica based upon the

performance metric value of at least one network router located in a path from the client computer to the replica router.

15. (Canceled)

16. (Previously Presented) The method of claim 10 further comprising the step of directing the client computer to a server replica that is estimated to provide good performance based upon the client computer's location in the network by directing the client computer to a replica router lower in a replica router hierarchy.

17. (Previously Presented) The method of claim 16 further comprising the step of causing a replica router advertisement to be sent from the replica router to a replica router higher in the replica router hierarchy, the replica router advertisement containing information from which the replica router higher in the hierarchy calculates the performance metric value, the replica router higher in the hierarchy storing the replica router advertisement in the database of advertisements.

18. (Previously Presented) An network replica router comprising:

- at least one communications interface;

- a processor coupled to the at least one communications interface; and

- a memory coupled to the processor;

- wherein the processor is configured to:

- receive replica advertisements, each of the advertisements containing at least one identifier of a network in the network to be serviced by at least one server replica;

- maintain a database of the server replica advertisements;

- receive network requests from a client computer; and

- direct the client computer to one of the at least one server replicas based upon the relationship between the networks identified in the advertisements in the database and a network in which the client computer is located.

19. (Previously Presented) For a replication router, a method of replica routing in a network comprising the steps of:

- receiving replica advertisements, each of the advertisements containing at least one identifier of a network in the network to be serviced by at least one server replica;
- maintaining a database of the server replica advertisements;
- receiving network requests from a client computer; and
- directing the client computer to at least one server replica based upon the relationship between the networks identified in the advertisements in the database and a network in which the client computer is located.

20. (Previously Presented) A computer program product having a computer-readable medium including computer program logic stored thereon that, when performed on a computer, causes the computer to:

- receive a network request from a client computer;
- calculate a performance metric value for each of at least two server replicas, the value specifying an estimated communication performance between the client computer and the server replica based upon the client computer's location in a network;
- direct the client computer to at least one server replica that is estimated to provide good performance based upon the client computer's location in the network based on the performance metric values of the server replicas as calculated by the replica router.

21. (Previously Presented) A computer program product having a computer-readable medium including computer program logic stored thereon that, when performed on a computer, causes the computer to:

- receive replica advertisements, each of the advertisements containing at least one identifier of a sub-network in a network to be serviced by at least one server replica;
- maintain a database of the server replica advertisements;
- receive network requests from a client computer; and

direct the client computer to at least one server replica based upon the relationship between the networks identified in the advertisements in the database and a network in which the client computer is located.

22. (Previously Presented) A replica router comprising:

- at least one communications interface;

- a processor coupled to the at least one communications interface; and

- a memory coupled to the processor;

- wherein the processor includes:

  - a means for receiving a network request for access from a client computer;

  - a means for calculating a performance metric value for each of at least two server replicas, the value specifying an estimated communication performance between the client computer and a server replica based upon the client computer's location in a network; and

  - a means for directing the client computer to at least one server replica that is estimated to provide good performance based upon the client computer's location in the network based on the performance metric values of the server replicas as calculated by the replica router.

23. (Previously Presented) A replica router comprising:

- at least one communications interface;

- a processor coupled to the at least one communications interface; and

- a memory coupled to the processor;

- wherein the processor includes:

  - a means for receiving replica advertisements, each of the advertisements containing at least one identifier of a sub-network in a network to be serviced by at least one server replica;

  - a means for maintaining a database of the server replica advertisements;

  - a means for receiving network requests from a client computer; and

a means for directing the client computer to one of the at least one server replicas based upon the relationship between the networks identified in the advertisements in the database and a network in which the client computer is located.

24. (Previously Presented) A method as in claim 10, wherein calculating the performance metric value for each of the at least two servers includes:

- sending a network router solicitation message to learn of a presence of nearby network routers;

- receiving routing table information from the nearby network routers; and
- deriving the performance metric values based on the routing table information.

25. (Previously Presented) A method as in claim 24, wherein the performance metric values identify respective estimated bandwidth values associated with the server replicas and wherein deriving the performance metric values includes at least one of:

- i) utilizing a number of hops required to reach a distant network from the replication router to determine the performance metric values, the number of hops being converted to an estimated bandwidth by reducing bandwidth from an ideal amount for each hop reported, and

- ii) generating a ping from the replication router to the distant network, and
- iii) estimating a performance metric value associated with a respective server based on the ping.

26. (Previously Presented) A method as in claim 25 further comprising:

- contacting root replica servers in the network to retrieve a list of respective server replica addresses and replica router addresses; and

- extending a performance map using a traceroute utility from the replication router to the server replica addresses and the replica router addresses.

27. (Previously Presented) A method as in claim 10, wherein steps of receiving, calculating, and directing occur in the replication router, and wherein receiving the network request from the client computer prompts the replication router to identify a network identifier associated with the request based on a source address of the client computer included in the request, the network identifier indicating a network in which the client computer resides.

28. (Previously Presented) A method as in claim 27 further comprising:

- matching the source address of the request to entries in replica summary records, at least one of the entries indicating the at least one server replica that is estimated to provide the good performance;

- sorting matched entries by network performance;

- in response to detecting multiple matches with entries in the replica summary records, identifying a particular one of the at least one server replica that is estimated to provide the best performance of multiple server replicas indicated by the matched entries; and

- wherein directing the client computer to the at least one server replica includes forwarding a message to the client computer indicating the at least one server replica that is estimated to provide the best performance.

29. (Previously Presented) A method as in claim 10, wherein steps of receiving, calculating, and directing occur in the replication router, and wherein receiving the network request from the client computer prompts the replication router to search for a match of a network identifier associated with the request and an replica summary record entry, the network identifier being derived from a source address associated with the request, the source address indicating a network in which the client computer resides, the method further comprising:

- in response to failing to match a source address in the request with an entry in the replica summary record:



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i) determining a network route from the replication server to the client computer, and

ii) identifying an address associated with each of multiple network routers in the network route between the replication server and the client computer.

30. (Previously Presented) A method as in claim 29 further comprising:

iii) for at least one replica summary record associated with a given one of the multiple network routers in the network route between the replication server and the client computer, searching for matches between the network identifier associated with the request and respective entries of the at least one replica summary record associated with the given one of the multiple network routers in the network route,

iv) sorting the matches based on an aggregate network performance metric,

v) selecting which of the respective entries has a best corresponding performance metric to handle the request, and

wherein directing the client computer includes redirecting the client computer to the at least one server replica.

31. (Previously Presented) A method as in claim 30, wherein determining the network route includes determining a hop-by-hop delay in a respective header associated with the request using a traceroute utility.

32. (Previously Presented) A method as in claim 10 further comprising:

receiving a particular request from a second client computer;

searching replica summary record entries maintained by the replication router by attempting to match a network identifier associated with a source address of the particular request with a respective entry of the replica summary record entries;

in response to failing to find a sever replica that can service the request based on the source address of the particular request and a respective location of the second client computer in the network, responding to the particular request by returning

requested information associated with the particular request directly from the replication router in lieu of redirecting the second client computer to another server.

33. (Previously Presented) The method of claim 10 further comprising the steps of:

- receiving advertisements from the server replicas, the advertisements containing information from which the replica router calculates the performance metric values;

- maintaining a database of the server replica advertisements.

- matching the replica advertisements to their actual source IP address where each of the replica advertisements contain the actual source IP address of the server replica;

- determining whether any of the server replicas are located behind firewalls;

- receiving a description of a client computer's network environment;

- calculating the performance metric value for a server replica based upon the description of the client computer's network environment; and

- calculating the performance metric value of a server replica based upon a respective performance metric value associated with at least one network router located in a path from the client computer to the replica router;

- wherein directing the client computer includes i) redirecting the client computer to a server replica that is estimated to provide good performance based upon the client computer's location in the network by redirecting the client computer to a replica router lower in a replica router hierarchy, ii) causing a replica router advertisement to be sent from the replica router to a replica router higher in the replica router hierarchy, the replica router advertisement containing information from which the replica router higher in the hierarchy calculates the performance metric value, the replica router higher in the hierarchy storing the replica router advertisement in the database of advertisements.

34. (Previously Presented) A method as in claim 10, wherein directing the client computer includes:

redirecting the request to a successively lower router in a respective hierarchy of routers in the network, the successively lower router to which the request is redirected concluding that the successively lower router in the hierarchy is an appropriate router to service the request.

35. (Previously Presented) A method as in claim 10, wherein directing the client computer includes:

redirecting the request to a successively lower router in a respective hierarchy of router in the network until the client computer is redirected to a respective router that is knowledgeable about making a decision regarding which of the at least one server to redirect the client computer to service the request.

36. (Previously Presented) A method as in claim 1, wherein the performance metric associated with the at least two server replicas is used to redirect the client computer to a respective replica server in close proximity to the client computer, the performance metrics corresponding to respective round-trip times for sending messages between the client computer and the at least two server replicas.